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Patent Claims

1. Synchronizing device for a shift transmission, with at least one outer and one inner synchro ring and, if appropriate, at least one intermediate ring, the synchro rings and the intermediate ring in each case having conical surfaces, via which they are connected at least indirectly to one another, and at least one of the synchro rings and/or the intermediate ring consisting of a metallic basic material, characterized in that at least one of the synchro rings (8, 10) and/or the intermediate ring (9) consisting of the metallic basic material being nitride-hardened in such a way that, by process parameters being set during nitride-hardening, a non-metallic γ'-connecting layer and/or a non-metallic ε-connecting layer is formed on the conical surface (11, 12) of the synchro ring (8, 10) and/or on the conical surface (13, 14) of the intermediate ring (9).

2. Synchronizing device according to Claim 1, characterized in that the γ'-connecting layer consists of Fe_4N.

3. Synchronizing device according to Claim 1 or 2, characterized in that the ε-connecting layer consists of $Fe_{2.3}N$.

4. Synchronizing device according to Claim 1, 2 or 3, characterized in that the at least one synchro ring (8, 10) and/or the intermediate ring (9) is plasma-nitride-hardened.

5. Synchronizing device according to one of Claims 1 to 4, characterized in that the metallic basic material of the at least one synchro ring (8, 10) and/or of the intermediate ring (9) is a sintered material.

6. Synchronizing device according to one of Claims 1 to 4, characterized in that the metallic basic material of the at least one synchro ring (8, 10) and/or of the intermediate ring (9) is a sinter-forged material.

7. Synchronizing device according to one of Claims 1 to 4, characterized in that the metallic basic material of the at least one synchro ring (8, 10) and/or of the intermediate ring (9) is a hardenable steel.

8. Synchronizing device according to one of Claims 1 to 7, characterized in that the nitriding depth is 200 to 800 μm.

9. Synchronizing device according to one of Claims 1 to 8, characterized in that the γ'-connecting layer or the ε-connecting layer is 1 to 20 μm, preferably approximately 10 μm, thick.

10. Synchronizing device according to one of Claims 1 to 9, characterized in that the intermediate ring (9) is arranged between the inner synchro ring (10) and the outer synchro ring (8), the conical surfaces (13, 14) of the intermediate ring (9) having a friction layer, and the γ'- or ε-connecting layer being in each case located on the conical surfaces (11, 12) of the two synchro rings (8, 10) in the outer region.

11. Synchronizing device according to one of Claims 1 to 9, characterized in that the inner synchro ring (10) or the outer synchro ring (8) is firmly connected to the gearwheel (3), the γ'- or ε-connecting layer being applied to one synchro ring (8, 10), and the friction layer being applied to the other synchro ring (8, 10).